WHAT IS CLAIMED IS:

1   1.   A method for controlling access to a communication channel in a communication

2   system, comprising the steps of:

3   calculating an efficiency value for each communication device of a plurality of

4   communication devices;

5   calculating a fairness value for each said communication device of said plurality of

6   communication devices; and

7   providing each of said plurality of communication devices with access to said

8   communication channel based on a result of the calculating steps.

1   2.   The method of Claim 1, wherein the calculating and providing steps are performed

2   by a slave selector in a master communication device, and wherein said plurality of communication

3   devices comprise a plurality of slave communication devices.

1   3.   The method of Claim 2, wherein said providing step comprises said master

2   communication device polling each of said plurality of slave communication devices based on a

3   result of said calculating steps.

1   4.   The method of Claim 3, wherein said step of calculating an efficiency value for each

2 slave communication device comprises calculating an efficiency value based, at least in part, on

3 at least one of the presence of data to send from said master communication device to a slave

4 communication device, and either a traffic demand message sent from a slave communication

5 device to the master communication device or an estimate of the probability that a slave

6 communication device has data to send to the master communication device.

5.   The method of Claim 3, wherein said step of calculating a fairness value for each

slave communication device comprises calculating a fairness value based on a predetermined

definition of fairness.

6.   The method of Claim 5, wherein said predetermined definition of fairness includes

agreed to Quality of Service requirements.

1   7.   The method of Claim 1, wherein said communication system comprises a Bluetooth

2 communication system.

1   8.   A method for controlling access to a communication channel, comprising the steps

2 of:

3   calculating an efficiency value for each communication device of a plurality of

4   communication devices;

5   calculating a fairness value for each said communication device of said plurality of

6   communication devices; and

7   selecting a first communication device from said plurality of communication devices to be

8   provided access to said communication channel based on a result of said calculating steps.

1   9.   The method of Claim 8, wherein said calculating steps and said selecting step are

2   performed by a slave selector in a master communication device, and wherein said plurality of

3   communication devices comprise a plurality of slave communication devices.

1   10.   The method of Claim 9, wherein said selecting step comprises selecting the first

2   slave communication device to poll based on a result of said calculating steps.

1   11.   The method of Claim 10, wherein said step of calculating an efficiency value for

2   each slave communication device comprises calculating an efficiency value based, at least in part,

3   on at least one of the presence of data to send from said master communication device to a slave

4   communication device, and either a traffic demand message sent from a slave communication

5   device to the master communication device or an estimate of the probability that a slave

6   communication device has data to send to the master communication device.

1   12.   The method of Claim 8, wherein said step of calculating a fairness value for each

2   slave communication device comprises calculating a fairness value based on a predetermined

3   definition of fairness.

1   13.   The method of Claim 11, wherein said predetermined definition of fairness includes

2   agreed to Quality of Service requirements.

1   14.   The method of Claim 9, wherein said master communication device and said

2   plurality of slave communication devices comprise a piconet in a Bluetooth communication system.

1   15.   A system for controlling access to a communication channel, comprising:

2   a primary communication device; and

3   a plurality of secondary communication devices, said primary communication device

4   operable to:

5   calculate an efficiency value for each of said secondary communication devices;

6   calculate a fairness value for each of said secondary communication devices; and

7   select a first communication device from said plurality of secondary communication

8   devices to be provided access to said communication channel based on a result of said

9   calculated efficiency value and said calculated fairness value.

1   16.   The system of Claim 15, wherein said primary communication device comprises a

2   master communication device, said plurality of secondary communication devices comprises a

3   plurality of slave communication devices, and wherein said first communication device is selected

4   by polling said first communication device.

1   17.   The system of Claim 16, wherein said master communication device includes a

2   slave selector for selecting said first slave communication device.

1   18.   The system of Claim 16, wherein said slave selector includes:

2   a fair share determinator for determining a fair share of bandwidth for at least one of said

3   plurality of slave communication devices;

4   a decision maker for determining said next slave communication device to be polled out

5   of said plurality of slave communication devices; and

6   at least one slave status tracker for transmitting, to said decision maker, a fraction of said

7   fair share of bandwidth and a probability of data being available to transmit for said at least one of

8   said plurality of slave communication devices.

1   19.   The system of Claim 18, wherein said at least one slave status tracker further

2   comprises:

3   a fraction of fair share estimator for estimating said fraction of said fair share of bandwidth;

4   a data availability predictor for predicting said probability of data being available to

5   transmit for said at least one of said plurality of slave communication devices; and

6   a traffic demand estimator for estimating a traffic demand for at least one of said at least

7   one slave status tracker.

1   20.   The system of Claim 16, wherein said system comprises a Bluetooth communication

2   system.

1   21.   A master device for controlling at least one slave device in a communication system,

2   said master device comprising:

3   a slave selector for predicting a next slave device from a plurality of slave devices to be

4   polled, said slave selector comprising:

5   a fair share determinator for determining a fair share of bandwidth for at least one

6   of said plurality of slaves devices;

7   a decision maker for determining said next slave device to be polled out of said

8   plurality of slave devices; and

9   at least one slave status tracker for transmitting, to said decision maker, a fraction

10   of said fair share of bandwidth and a probability of data being available to transmit for said at least

11   one of said plurality of slave devices.

1   22.   The master device of claim 21, wherein said at least one slave status tracker further

2   comprises:

3   a fraction of fair share estimator for estimating said fraction of said fair share of bandwidth;

4   a data availability predictor for predicting said probability of data being available to

5   transmit for said at least one of said plurality of slave devices; and

6   a traffic demand estimator for estimating a traffic demand for at least one of said at least

7   one slave status tracker.